

# **Effect of women's education, by a countries economic status, on women's employment**

This research thesis tries to gain knowledge on the effects of women's education on women's employment in four middle- and high-income countries; China, Japan, South Korea, and Taiwan. Human Capital Theory and U-shape Female Labor Participation theory are used to predicting the differences in women's employment in these four countries. Using data from the East Asian Social Survey (2006), the hypothesis is tested. According to the World Bank (nd) China is considered a middle-income country, Japan, South Korea, and Taiwan are considered as high-income countries. It is found that China has higher female employment rates compared to Japan, South Korea, and Taiwan. Furthermore, the results indicate only a small increase in the effect of education on the probability of women's employment for high-income countries, compared to middle-income countries.

**Keywords:** Female educational attainment; Female educational status; South East Asia; Female employment; Middle- and High-income countries

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Female employment is a modern and broadly discussed topic of scientific research. Female employment, or the lack thereof, is often discussed with the influence of fertility. Education is commonly used as one of many independent variables when discussing female employment, and not the main focus. Previous research on employment after becoming a mother found that the higher a women's educational level, the more likely she is to be employed after child-bearing (Gutierrez-Domenech, 2005). A similar trend was found which states that well-educated women are less likely to leave paid-jobs and go back to paid-work sooner (Brewster, 2000). Nevertheless, there are stark differences between education rates and employment rates of women in general. Research is done on the evolution and revolution of women's employment in the previous century. It is found that after decades of increasing women's employment levels, women's employment has stagnated more or less since 1990 (Goldin, 2006). The question to how this stagnation phenomenon exists remains.

Women are getting more and more education. Yet, the contribution of women on the labor market is not increasing the same way. On a global level, female education is expanding. Worldwide, the enrollment of boys and girls in primary education is almost the same. In developed areas the enrollment of women in tertiary education is even higher than for men (United Nations, 2015). However, in 2019 the global female labor force participation rate was 47.14 percent of the total female population from 15 years and above (The World Bank, 2020) The global male labor participation rate was 74.2 percent in 2019 (The World Bank, 2020). It would be expected that when the number of girls going to school is the same as the number of boys, that the number of women active on the labor market would be similar to that of men. However, this does not seem to be the case. Hence, there is a gap between the educational levels of girls and their input on the labor market.

The societal relevance of working women makes it interesting to research this relationship between women's education and employment. Research has pointed out the importance of both female education and female employment on the mental health of women (Schnittker, 2007). Another benefit of increasing women's education is that it leads to wages that are more comparable to men's wages (Summer, 1992). It would therefore be more beneficial for women to be employed. Thus, the question of why women work less than men still remains. This thesis, therefore, aims to gain knowledge on the influence of education on female employment. The U-Shape Female Labor Participation Theory (UFLP-theory) and the Human Capital Theory are used to gaining knowledge on the influence of education on female

employment in four middle- and high-income countries in South East Asia. The UFLP-theory is often discussed and evaluated within the topic of women's employment (see, e.g., Lincove, 2008; Goldin, 1995; Tam, 2010 ). This theory suggests a U-shaped relation between female education and female employment. The Human Capital theory is a general economic theory which directly links educational attainment to employment (Becker, 2002). The current study will focus on China, Japan, South Korea, and Taiwan. These countries are chosen as most previous research focusses on either developing countries or on developed countries in the West. Less research is done on developed countries outside of the West. China, Japan, South Korea, and Taiwan are four middle- and high-income countries in South East Asia. In terms of cultural aspects the countries lay close together, though there are clear differences as well. China is considered a middle-income country. Japan, South Korea, and Taiwan are considered high-income countries. The goal of this thesis is to gain knowledge on the effects of education on female employment in these four countries. The question that will be central during this thesis is: *What is the effect of women's education on women's employment status?*

### **Country background information**

To get a better understanding of the four countries investigated in this thesis, background information on the labor market, economic development, and education for each country will be provided. The focus will be on female labor force and female education. Besides the female labor force this study looks at the developmental level of each country. The World Bank (nd) uses the World Development Indicators to categorize countries in low-income, middle-income and high-income countries. This measurement will be used to indicate the developmental level of the four countries in this thesis. Whether a country is classified as low-middle- or high-income is based on its Gross National Income (GNI) rate per capita in US dollars (The World Bank, nd). The GNI per capita is the total utility of goods and services that have been produced in a country divided by the population number (Cambridge Dictionary, nd). The relevance of the developmental level of a country will be discussed in the theory section. Furthermore, information from The World Bank will be used to gain knowledge on the female labor force in the four countries. The female labor force entails all women ages 15 and older. The labor force participation rate is the percentage of all women, from 15 and above, that are active on the labor market. Being active on the labor market means that a person is employed or that this person is seeking work (the World Bank, 2020).

## *China*

China's female labor force participation is in a downward trend since 1990 until 2019 (The World Bank, 2020). The female labor force participation rate went down from 73 percent in 1990 to 60 percent in 2019. To further look into data on how female educational attainment correlates with female labor force participation a side note has to be made on China's educational attainment in general. Data from the Organization for Economic Cooperation and Development (OECD,2018) shows that China has relatively low tertiary education levels in general. However, the data also show that there are almost no differences between men and women: 60 percent of men and 63 percent of women are below upper secondary education, 19 percent of men and 16 percent of women have an education on upper secondary or post-secondary non-tertiary level and 18 percent of both men and women have had education on tertiary level in 2017(OECD,2018). The World Bank considers China as a (upper)middle-income country. China's GNI per capita is 9,4600 US dollars. The World Bank considers a country as upper middle-income when the GNI per capita of 2017 was between 3,896 and 12,055 US dollars (The World Bank, nd).

## *Japan*

In Japan, the female labor force participation rate was 50.1 percent in 1990 and was followed by periods of decline combined by periods of small increase until 2012 (The World Bank, 2020). In 2012 this rate declined to 42.8 percent. The female labor participation rates increased again until 2019 at 52.7 percent (The World Bank, 2020). However, despite an increasing labor participation rate the percentage of females with tertiary education who do not participate in the labor market is 32 percent. The percentage of males with tertiary education who do not participate in the labor market is 5 percent (OECD, 2014). This is far higher than the OECD-average where 12 percent of women with tertiary education are not active in the labor market. Furthermore, the percentage of women (aged 25-34) with tertiary education has increased from 49 percent to 61 percent in the period of 2000 until 2012. In 2012 that same rate for Japanese men was 56 percent (OECD, 2014). However, women opt for lower levels of tertiary education more than the higher levels. Japan has the lowest percentage of female graduates on the doctoral level of all OECD-countries (OECD, 2019).

Japan is considered as a high-income country (World Bank, 2020). Japan's GNI per capita is 43,310 US dollars in 2018. A high-income country is considered to have an GNI per capita that is above 12,055 US dollars per year (The World Bank, nd).

### ***South Korea***

The World Bank (2020) shows an increase in the percentage of female labor force in South Korea over the past decades from 1990 to 2020. In 1990 the female labor force participation rate was 47 percent. Short declines are shown in times of economic recession, such as during the 2008 global recession. In 2019, the female labor force participation rate was 53 percent. The tertiary educational attainment of 25-34 year-olds in South Korea was 76 percent for women and 64 percent for men, in 2018. This is higher than the OECD-average of respectively 51 percent and 38 percent (OECD, 2019). The employment rates of 25-34 year-olds are with 78 percent below the OECD-average of 85 percent (OECD, 2019). South Korea is considered a high-income country (World Bank, 2020). South Korea's GNI per capita was 30,620 US dollars in 2018.

### ***Taiwan***

The female labor force participation rate of Taiwan has slightly increased over the past decade. In 2008 the female labor participation rate was 49.7 percent in 2018 it was 51.1 percent (Statista, 2019). There is no data on Taiwan's income level by the World Bank. However, the World Bank also publishes the *list of economies* every year. This list also considers regions that are not formally considered as a country by the World Bank (World Bank, 2020). Taiwan is considered a high-income economy (World Bank, 2020).

## **Theoretical background**

### **The human capital theory**

The Human Capital theory is broadly known by Becker who wrote about it for the first time in 1962 (Becker, 2002). The Human Capital theory is a general economic theory on the benefits of education. In short it says that by expanding an individual's education, this individual benefits both himself and his or her employer. Through education someone gains certain skills and tools which are attractive to employers. Therefore, education increases labor market perspectives. Both the individual and the employer will make rational decisions on the labor market. For the individual, increasing your own education has to result into better labor market prospects. The employer will make a rational decision whether the benefits will outweigh the costs of individuals with higher education. The employee benefits because they now have more prospects on their working life. Moreover, they bond better with their current

working place. Thus, from a human capital perspective an increase in female education will lead to an increase in female labor as females' possibilities on the labor market expand. Furthermore, human capital theory suggests that the benefits of education should outweigh the costs of education. England et al. (2012) tested this in their research paper *Women's employment, education and the gender gap in 17 countries*. England et al. test whether women are more likely to be employed if they have higher education. They put opportunity effects against income effects. Opportunity effects imply that when women increase their education level, the benefits of the wage increase are higher than the costs of being employed e.g. costs of daycare, a cleaner, etc. With income effects England et al. (2012) imply reasons why women would not be employed. This point of view states that women with higher levels of education will likely have a spouse who has higher levels of education as well. Because the spouse's earnings will be sufficient to live from, there is no need for the wife to be employed. Therefore, income effects suggest that the higher a women's educational level, the more likely she is to be unemployed. England et al. conclude that opportunity effects are stronger than income effects. This aligns with the human capital theory which also states that women with a higher education level are more likely to be employed. Another reason for an individual to increase its education is that a diploma works as a credential position. Education follows standards that employers can rely on and give them a security of what you are capable of. Hence, the benefits have to outweigh the costs of employing someone. Thus, when women expand their education to a higher degree, women are not only more likely to work because they earn more, they are also more likely to be employed because their value to the employer is higher. It is suggested that if a person increases his or her education, this person is more likely to be employed.

### **The U-shaped female labor participation theory**

The U-shaped theory on female labor participation argues that female labor rates are higher in low and high-income countries and lower in middle-income countries (Goldin, 1994). It therefore follows a U-shape. Low-income countries are not developed much and will typically have higher female participation rates. These higher female participation rates are ascribed to a higher demand for female labor. In developing countries women mostly work in the agriculture or small-business sector (Goldin, 1994). When these countries start to develop more, the female labor participation will drop. Therefore, according to this theory middle-income countries tend to have lower female participation rates. This decrease in labor has different explanations such as gender attitudes or that industrial work is less fitted for women.

The physical labor and gender discrimination can result into rejection of females on the labor market (Pampel and Tanaka, 1986). Furthermore, their research found that middle-income countries were not much affected by expansion of industrial work, which confirms the UFLP theory. There appears to be a high social stigma on women working in blue-collar, man dominated, jobs which is enhanced by the idea that the need for women to have a financial input is lower (Goldin, 1995). Again, high-income countries have higher female labor participation. Goldin suggests that the female labor participation grows when women have perspectives for white-collar jobs. The social stigma as seen for women working in blue-collar jobs does not appear to white-collar jobs (Goldin, 1995). The U-shape female labor participation theory has been used in several former research papers. Lincove (2008) did a longitudinal study of the economic growth, education and female labor with many different countries. However, the focus of the study was to gain knowledge on growth and education effects in developing countries (Lincove, 2008) . Middle- and high-income countries are often not the focus or are even left out from previous studies. Furthermore, most research on women's employment in developed countries focusses on North American or West-European countries. Evertsson et al. (2009) did research on the level of gender inequality between lower- and higher educational levels. This research focused on the Netherlands, Sweden and the United States and found that women with lower educational levels were less often employed. Work-ethics and other cultural factors might influence the effect of education on employment in other regions of the world. Tam (2010) used a time series research to investigate the U-Shape Female Labor Theory in 130 countries. The time cohorts lay between 1950 and 1980. His results show an intertemporal U-shaped pattern of female labor participation in relation with the economic status of the country.

This thesis will combine Human Capital theory with the U-shape female labor participation theory. The Human Capital theory states that women make rational choices on obtaining more education and therefore increasing their probabilities to be employed if, the benefits outweigh the costs. The UFLP theory connects a country's economic level to female employment. With these theories combined it is suggested that education will have a positive effect on women's employment. However, this effect will be decreased or increased by the economic stage of a country. Therefore, higher education is expected to have a bigger influence in low- or high-income countries compared to middle-income countries. Looking at the countries in this research, it is expected that China has lower female employment rates than Japan, South Korea and Taiwan. China is considered as a middle-income country, it therefore is suggested

that the costs of female education are more often higher than the benefits compared to Japan, South Korea and Taiwan which are considered high-income countries. This difference is explained by the suggestion that middle-income countries have more labor-intensive work which, according to the UFLP-theory, negatively affects women's employment.

From these theories one hypothesis is derived: *The higher the education level of a woman, the more likely she is to be employed, this effect will be larger for low- and high-income countries compared to middle-income countries.*

### **Data and method**

For this research thesis data will be used from the East Asia Social Survey (EASS) series, 2006. The EASS dataset follows China, Japan, South Korea and, Taiwan. This survey was the first out of a series of four surveys with different foci; Families (2006), Cultures and Globalization (2008), Health and Society (2010) and Network Social Capital (2012). For this thesis a selection of the dataset from 2006 will be used regarding females' working life and education.

#### **Independent variables**

The independent variable in this research is education. In the EASS, the level of education of women is measured by degree and by education in years. The complication with education by degree, for this research, is that every country has its own educational system. This would make interpretation of the results very difficult as a degree in one country is not the same as a degree in another. Therefore, education in years is used as it makes interpretations between the countries more valuable. To use education by years in the analysis, no adjustments are made to the variable. Education is a nominal variable that measures how many years the respondent has had an education.

Country is a categorical variable. In the original dataset the variable is divided into 1; China, 2; Japan, 3; South Korea and 4; Taiwan. In this thesis China will be considered as the reference group the variable is recoded. Now China equals 0, Japan equals 1, South Korea equals 2 and Taiwan equals 3.



## **Dependent variable**

Women's employment status is a dichotomous variable measuring the respondent's employment status with either yes; employed, or no; not employed. This variable does not exist in the original dataset and is therefore computed from a categorical variable; 'respondents employment status' in the original dataset. Respondents were asked to fill in their current employment status on a range from 1 to 10. 1; '*employed full-time*' 2; '*employed part-time*' 3; '*self-employed*' 4; '*helping family member*' 5; '*unemployed*' 6; '*studying, school, vocational training*' 7; '*retired*' 8; '*housewife, -man, home duties*' 9; '*permanently disabled*' 10; '*TW: employer*'. The variable is computed into 1, 2, 3 and 10 as 1; '*employed*'. 5 and 8 are computed as 0; '*not employed*'. The remaining categories are not to be found meaningful for this thesis because they imply reasons why someone is not working and also not looking for paid labor. These people are thus not active on the labor market i.e. the respondent is a student, disabled, retired etc. These remaining categories are categorized as 'Missing Values'.

## **Control variables**

Gender attitudes are used as control variable. Five questions on a Likert scale are combined into the mean gender attitudes scale per respondent. Gender attitudes can imply why women both (1) do not seek out for high education and (2) are not employed. For example, when a woman feels like it is the husband's job to earn money it is likely that she will be unemployed. Therefore, gender attitudes are an important control variable as they might have an influence on the outcomes. The questions from the EASS used for this research are:

*'It is more important for a wife to help her husband's career than to pursue her own career'*

*'A husband's job is to earn money; a wife's job is to look after the home and family'*

*'Men ought to do a larger share of household work than they do now'* (This variable will be reversed, in order to make the direction the same as the other questions)

*'During economic recession, it is all right for women to be laid-off than prior to men'*

*'The authority of father in a family should be respected under any circumstances'*

The questions in the original variables range on a Likert scale from 1 to 7 with 1 being 'strongly agree' and 7 'strongly disagree'. In this research a new variable is computed which measures the mean of all 5 questions of a respondent together.

Marital status is the second control variable. This variable measures someone's marital status. The variable will be used as the original in the EASS. Lastly age is used as a control variable. This variable does not have to be changed from the original in the dataset.

The dataset includes both men and women, before running tests all data will be filtered to women only. Table 1 shows there are, in total, 666 (13.7 percent) missing values on women's employment. The first model shows the effect of education on employment. In model one a simple regression will be done with the dependent variable employment and the independent variable of education by years. The second model shows the interaction of employment and country. For the second model two more independent variables are added. The first variable is the country, with China as reference group. The second variable is the interaction effect of education with the country. The third model adds the control variables to the second model. The control variables are gender attitudes, age and marital status. The control variables will test for robustness. This thesis will use an ordinary least squares regression (OLS-regression) to test the probability of employment by education in four different countries. country. Before the analyses can be performed, some side-notes need to be made for using OLS-regression. The OLS-regression is a method that allows the testing of models with dichotomous dependent variables. When using the OLS-regression with a dichotomous dependent variable the interpretation will not be on the effect of variable Y on outcome X but, the interpretation will be on the probability of the outcome variable X, with the effect of Y. However, using the OLS-regression can be problematic especially when the observed probabilities of the outcome variable are not between .3 and .8. Therefore, it is suggested to only use OLS-regression when the observed probabilities are between this range. The observed probabilities of employed women in this dataset are between .31 and .7, thus OLS-regression can be used.

## Results

### Descriptive statistics

Participants from all the four countries together were between the ages of 17 and 92, the average age is 45.57 (N = 4858, SD = 15.907). Table 1 shows the female employment rates. The total employment rate is 69.9 percent. The employment rates between the countries differ quite a bit. China scores highest of all four countries with an female employment rate of 88.8 percent of the respondents. Second highest is Taiwan with 65.5 percent. Japan's female employment rate is 54 percent. Lastly, South Korea's female employment is 53.1 percent

**Table 1**

*Women's employment status in China, Japan, South Korea, and Taiwan*

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>China</b>	.00 unemployed	187	10.7	11.2	11.2
	1.00 employed	1477	84.2	88.8	100.0
	Total	1664	94.9	100.0	
Missing	System	90	5.1		
Total		1754	100.0		
<b>Japan</b>	.00 unemployed	475	40.7	46.0	46.0
	1.00 employed	557	47.8	54.0	100.0
	Total	1032	88.5	100.0	
Missing	System	134	11.5		
Total		1166	100.0		
<b>South Korea</b>	.00 unemployed	324	36.4	46.9	46.9
	1.00 employed	367	41.2	53.1	100.0
	Total	691	77.6	100.0	
Missing	System	200	22.4		
Total		891	100.0		
<b>Taiwan</b>	.00 unemployed	277	26.5	34.4	34.4
	1.00 employed	528	50.4	65.6	100.0
	Total	805	76.9	100.0	
Missing	System	242	23.1		
Total		1047	100.0		
<b>Total</b>	Missing System	666	13.7		
<b>Total</b>		4858	100.0		

*Note.* empl\_st (employment status) filtered by fem\_ch (Female R: China), fem\_j (Female R: Japan), fem\_kr (Female R: South Korea), and fem\_tw (Female R: Taiwan)

Table 2 shows women's education by years of schooling in the four countries. The average years of schooling of all countries was 9.97 (SD = 4.525). The average years of schooling in China was 7.93 (SD = 4.349) which is the lowest of all four countries. The average years of schooling in Japan was 11.97 (SD = 2.293). The average years of schooling in South Korea was 11.28 years (SD = 4.684), which is the highest of the four countries. Lastly table 2 shows that the average years of schooling in Taiwan 10.02 years (SD = 5.157) is.

**Table 2**

*Women's education by years of schooling*

	N	Minimum	Maximum	Mean	Std. Deviation
EDUCYRS R: China	1671	0	23	7,93	4,349
EDUCYRS R: Japan	1146	6	18	11,97	2,293
EDUCYRS R: Sth. Korea	805	0	23	11,28	4,684
EDUCYRS R: Taiwan	984	0	23	10,02	5,157
EDUCYRS R: Total	4606	0	23	9,97	4,525
Valid N (listwise)	4606				

*Note.* EDUCYRS (Education in years of schooling) filtered by fem\_ch (Female R: China), fem\_j (Female R: Japan), fem\_kr (Female R: South Korea), and fem\_tw (Female R: Taiwan)

For a clearer outline, only the tables of the coefficients are shown in the text. An overview of all the tables can be found in the appendix. The first model (table 3) shows the relation between the employment status and the education in years of the respondents is tested. Table 3 shows no significant effect of education on employment ( $R^2 = .001$ ,  $F(1, 4080) = 2,228$ ,  $p = .136$ ). This indicates that women with more years of education are not more likely to be employed.

**Table 3**

*Effect of education on employment status*

		Unstandardized Coefficients		Standardized Coefficients		95,0% Confidence Interval for B		
Model 1		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	.707	.011		62.862	.000	.685	.729
	educ_c Education by years	.002	.002	.023	1.493	.136	-.001	.006

*Note.* Dependent Variable: empl\_st (Respondents employment status)

The second model (table 4) includes country as an independent variable. A score of 0 on country equals living in China, a score of 1 equals living in Japan, a score of 2 equals living in South Korea and a score of 3 equals living in Taiwan. Living in China equals living in a middle-income country. Living in Japan, South Korea or Taiwan equals living in a high-income country. This way the interpretation of a score 0 on country equals living in a middle-income country and a score 1, 2 or 3 equals living in a high-income country. China is the only middle-income country and is therefore considered as the reference group. First, something can be said on the model as a whole. Table 4 shows that the whole model is significant ( $R^2 = .086$ ,  $F(3, 4078) = 128.508$ ,  $p < .001$ ). Meaning that all the independent variables together have a significant effect on the probability of being employed.

Now it is interesting to look at each of the independent variables separately as this will give more insights on the differences between middle-income countries and high-income countries. Education shows the effect of education in years when someone scores 0 on country(China). This effect is  $-.005$ . Meaning that the probability of employment would decrease with .05 percent more with every year increase of education, for women in China. These findings are very unlikely and also not significant ( $b = -.005$ ,  $t = -2.204$ ,  $p = .028/2$ ). This means that according to these results there cannot be anything concluded on the probability of employment on women in China. The country variable shows the probability of employment for women living in Japan, South Korea or Taiwan compared to women living in China, when they have 0 years of schooling. Table 4 shows that there is a significant effect ( $b = -.032$ ,  $t = -3.266$ ,  $p = .001/2$ ). Meaning that women living in Japan, South Korea or Taiwan would be 3.2 percent less likely to be employed than women living in China if they have 0 years of schooling.

Lastly it is interesting to look at the interaction effect of country and education. This variable shows the effect of education in China compared to Japan, South Korea and Taiwan. These findings are significant ( $b = .013$ ,  $t = 9.925$ ,  $p < .001/2$ ). This means that the difference in the effect of education on the probability that someone is employed is 1.3 percent higher for women living in Japan, South Korea or Taiwan compared to women living in China.

**Table 4***Effect of education and country on employment status*

Model 2		Unstandardized Coefficients		Standardized Coefficients		95,0% Confidence Interval for B		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	.765	.018		42.771	.000	.730	.800
	educ_c Education by years	-.005	.002	-.047	-2.204	.028	-.009	-.001
	country Country of respondent	-.032	.010	-.079	-3.266	.001	-.051	-.013
	country_edu Interaction country and education	.013	.001	.249	9.925	.000	.010	.016

*Note.* Dependent Variable: empl\_st (Respondents employment status)

The third model (table 5) controls for the mean gender attitudes, the age of the respondent and the marital status. This is to test if the findings in model 2 are robust. Table 5 shows that the model itself is still significant ( $R^2 = .163$ ,  $F(6, 3073) = 132,417$ ,  $p < .001$ ). Table 5 implies that all variables are now statistically significant. The adjusted R square has increased from .086 in the second model to .162 in the third model. This means that adding more variables fits the model better as the effect size increases. The variable education however was not significant in model 2 but is significant now ( $b = -.015$ ,  $t = -6.666$ ,  $p < .001$ ). When the education variable is significant it would suggest that an increase in years spend on school increases a woman's probability of being employed. Because, education was not significant in model 2 but is significant in model 3, a suppressor effect is expected. Therefore, it is expected that the control variables thus have an influence on women's employment as well.

**Table 5***Effect of control variables on employment status.*

		Unstandardized		Standardize		95,0% Confidence		
		Coefficients		Coefficients		Interval for B		
Model 3		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	.808	.048		16.852	.000	.714	.902
	educ_c Education by years	-.015	.002	-.140	-6.666	.000	-.019	-.010
	country Country of respondent	-.057	.010	-.141	-5.966	.000	-.075	-.038
	country_edu Interaction country and education	.007	.001	.137	5.507	.000	.005	.010
	AGE R: Age	-.008	.001	-.243	-14.587	.000	-.009	-.007
	meanG_attitude Mean scale gender attitude	.054	.009	.102	6.256	.000	.037	.070
	MARITAL R: Marital status	.025	.005	.075	4.800	.000	.015	.035

*Note.* Dependent Variable: empl\_st (Respondents employment status)



## Conclusions

This thesis has contributed by gaining knowledge on the influence of education on women's employment in four middle- and high-income countries in South East Asia. The findings suggest evidence for the importance of women's education on women's employment, however, the evidence is not very large. This thesis sought to answer the question; *what is the effect of education on a women's employment status?* The EASS dataset on China, Japan, South Korea, and Taiwan was used. With an ordinary least squares regression employment as a dichotomous dependent variable. Education by years of schooling and the country where the respondent is living were used as independent variables. The findings partially correspond with the hypothesis, however, not entirely. The results do show a positive relation for years of schooling and high-income countries on employment. This suggests that in high-income countries the effect of education on the probability of being employed is higher compared to middle-income countries. However, the hypothesis implies that this effect will be visible, but lower, for middle-income countries. The findings show that in the case of China, the years of education do not have a significant effect on the probability for women to be employed. This corresponds with the descriptive statistics of China's employment levels, which in fact show very high female employment levels. These statistics indicate that China actually has high female employment levels regardless of female education. Which does not correspond with both the Human Capital theory as well as the UFLP-theory. Both theories would expect at least some influence of education on women's employment. The human capital theory would expect a positive relation between education and women's employment. The UFLP-Theory would, in the case of China, expect lower employment rates as it is a middle-income country. Furthermore, adding control variables shows that the results are not robust. The hypothesis can only partially be accepted and the evidence for it is weak. However, this thesis sheds light on the uncertainties of women's employment. In many studies on women's employment, education is not a main focus despite the fact that education is often positively related to employment rates. It is to say that education certainly is not the only, but rather one of many factors that influence women's employment.

## Discussion

The use of South East Asian countries contributes to the social sciences as a whole, as much research on developed countries is focused on European and North-American countries. Not all results align with the theories used in this thesis. The employment rates of all high-income countries are lower than the employment rates of the middle-income country, while the Human Capital Theory and UFLP-theory would expect the opposite. It is therefore suggested that future research looks into other theories on women's education and women's employment. Furthermore, future research should include more middle-income countries. This could give a clearer image of the effects of education in middle-income countries on the employment of women. Cultural or political aspects such as work-ethics could possibly explain why the effect of education on employment in China was not significant. Another recommendation is to include more countries from different regions and of different economic levels. Using countries of different regions could rule-out the possible culture-effects which might influence the outcomes of this thesis. This research thesis used the Ordinary Least Squares regression model to test the hypothesis. The OLS-regression is a useful tool for tests with dichotomous dependent variables. Normal t-tests have implications because they can only be used for nominal dependent variables. The main problem, however, with OLS-regression is that the outcomes of the dependent variable can exceed the 0 to 1 range. This would make the outcomes less meaningful. As mentioned before, the probability of employed women is between .3 to .8 range. If this is not the case it is recommended to use the Binary Choice Model instead. The Binary Choice Model is much harder to interpret but the dependent variable cannot exceed the 0 to 1 range, making the outcomes more meaningful. Finally, it can be said a lot still remains unclear regarding what determines women in middle- and high-income countries to be employed or not, nonetheless, education is an important factor.

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## Appendix

**Table 1**

*Women's employment status in China, Japan, South Korea, and Taiwan*

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>China</b>	.00 unemployed	187	10.7	11.2	11.2
	1.00 employed	1477	84.2	88.8	100.0
	Total	1664	94.9	100.0	
Missing System	90	5.1			
Total		1754	100.0		
<b>Japan</b>	.00 unemployed	475	40.7	46.0	46.0
	1.00 employed	557	47.8	54.0	100.0
	Total	1032	88.5	100.0	
Missing System	134	11.5			
Total		1166	100.0		
<b>South Korea</b>	.00 unemployed	324	36.4	46.9	46.9
	1.00 employed	367	41.2	53.1	100.0
	Total	691	77.6	100.0	
Missing System	200	22.4			
Total		891	100.0		
<b>Taiwan</b>	.00 unemployed	277	26.5	34.4	34.4
	1.00 employed	528	50.4	65.6	100.0
	Total	805	76.9	100.0	
Missing System	242	23.1			
Total		1047	100.0		
<b>Total Missing System</b>		666	13.7		
<b>Total</b>		4858	100.0		

*Note.* empl\_st (employment status) filtered by fem\_ch (Female R: China), fem\_j (Female R: Japan), fem\_kr (Female R: South Korea), and fem\_tw (Female R: Taiwan)

**Table 2***Women's education by years of schooling*

	N	Minimum	Maximum	Mean	Std. Deviation
EDUCYRS R: China	1671	0	23	7,93	4,349
EDUCYRS R: Japan	1146	6	18	11,97	2,293
EDUCYRS R: Sth. Korea	805	0	23	11,28	4,684
EDUCYRS R: Taiwan	984	0	23	10,02	5,157
EDUCYRS R: Total	4606	0	23	9,97	4,525
Valid N (listwise)	4606				

*Note.* EDUCYRS (Education in years of schooling) filtered by fem\_ch (Female R: China), fem\_j (Female R: Japan), fem\_kr (Female R: South Korea), and fem\_tw (Female R: Taiwan)

**Model 1** Effect of education on employment status

*Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.023 <sup>a</sup>	.001	.000	.46081

*Note.* a Predictors: (Constant), educ\_c Education by years

*ANOVA<sup>a</sup>*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.473	1	.473	2.228	.136 <sup>b</sup>
	Residual	866.361	4080	.212		
	Total	866.834	4081			

*Note.* a. Dependent Variable: empl\_st Respondents employment status

b. Predictors: (Constant), educ\_c Education by years

*Effect of education on employment status*

Model		Unstandardized Coefficients		Standardized Coefficients		95,0% Confidence Interval for B		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	.707	.011		62.862	.000	.685	.729
	educ_c Education by years	.002	.002	.023	1.493	.136	-.001	.006

*Note.* a. Dependent Variable: empl\_st Respondents employment status

## Model 2 Effect of education and country on employment status

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.294 <sup>a</sup>	.086	.086	.44069

Note. a. Predictors: (Constant), country\_edu Interaction country and education, educ\_c Education by years, country Country of respondent

### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	74.870	3	24.957	128.508	.000 <sup>b</sup>
	Residual	791.964	4078	.194		
	Total	866.834	4081			

Note. a. Dependent Variable: empl\_st Respondents employment status

b. Predictors: (Constant), country\_edu Interaction country and education, educ\_c Education by years, country Country of respondent

### Effect of education and country on employment status

Model		Unstandardized Coefficients		Standardized Coefficients		95,0% Confidence Interval for B		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	.765	.018		42.771	.000	.730	.800
	educ_c Education by years	-.005	.002	-.047	-2.204	.028	-.009	-.001
	country Country of respondent	-.032	.010	-.079	-3.266	.001	-.051	-.013
	country_edu Interaction country and education	.013	.001	.249	9.925	.000	.010	.016

Note. a. Dependent Variable: empl\_st Respondents employment status



**Model 3** Effect of control variables on employment status

*Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.404 <sup>a</sup>	.163	.162	.42177

*Note.* a. Predictors: (Constant), MARITAL R: Marital status, country\_edu Interaction country and education, meanG\_attitude Mean scale gender attitude, AGE R: Age, educ\_c Education by years, country Country of respondent

*ANOVA<sup>a</sup>*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	141.332	6	23,555	132.417	.000 <sup>b</sup>
	Residual	724.538	4073	.178		
	Total	865.870	4079			

*Note.* a. Dependent Variable: empl\_st Respondents employment status

b. Predictors: (Constant), MARITAL R: Marital status, country\_edu Interaction country and education, meanG\_attitude Mean scale gender attitude, AGE R: Age, educ\_c Education by years, country Country of respondent

*Effect of control variables on employment status*

Model		Unstandardized		Standardized		95,0% Confidence		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	.808	.048		16.852	.000	.714	.902
	educ_c Education by years	-.015	.002	-.140	-6.666	.000	-.019	-.010
	country Country of respondent	-.057	.010	-.141	-5.966	.000	-.075	-.038
	country_edu Interaction country and education	.007	.001	.137	5.507	.000	.005	.010
	AGE R: Age	-.008	.001	-.243	-14.587	.000	-.009	-.007
	meanG_attitude Mean scale gender attitude	.054	.009	.102	6.256	.000	.037	.070
	MARITAL R: Marital status	.025	.005	.075	4.800	.000	.015	.035

*Note.* a. Dependent Variable: empl\_st (Respondents employment status)